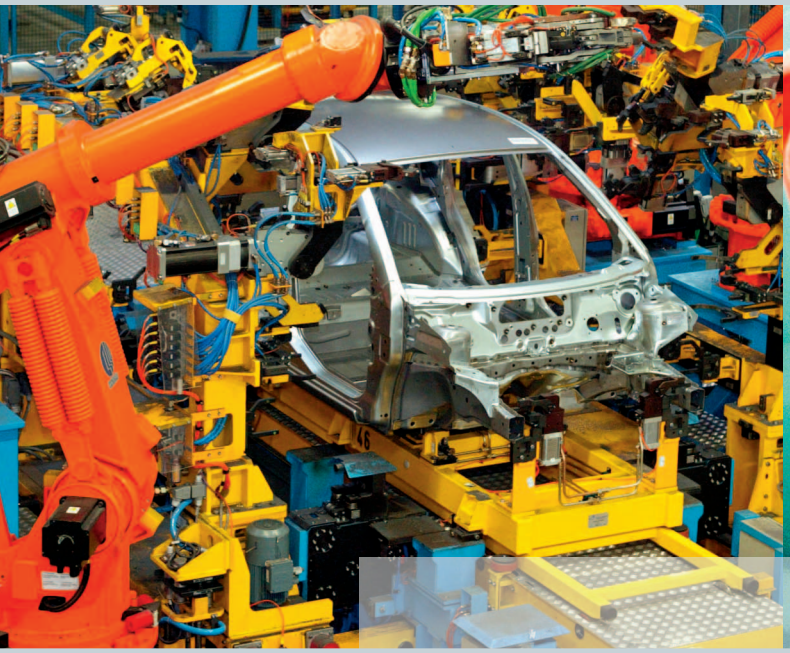


Product Information

Safety Systems

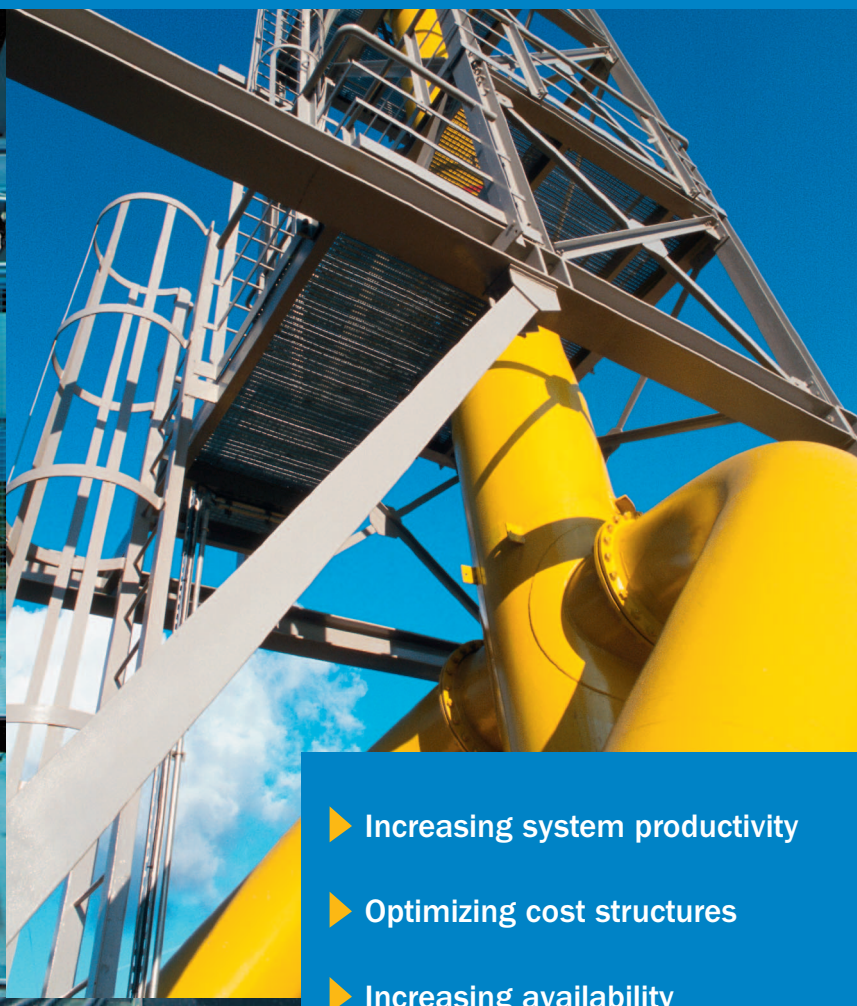
Intelligent interface modules

intelliface
the intelligent interface

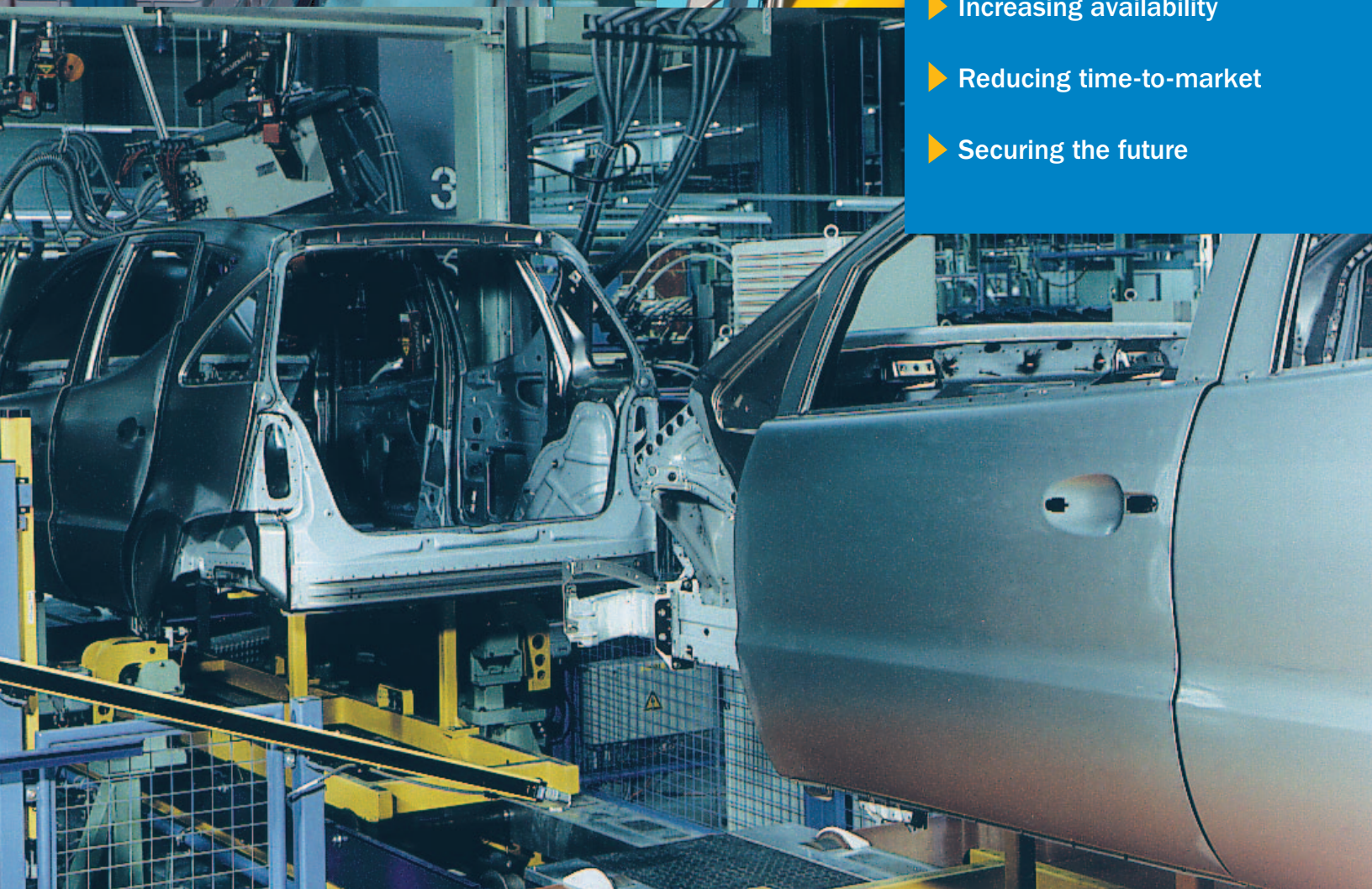
SICK

Is it possible for man and machine to cooperate safely?

Sure.



- Increasing system productivity
- Optimizing cost structures
- Increasing availability
- Reducing time-to-market
- Securing the future



Industrial safety needs more than just technology.

Superior quality

With the decision for a safety solution from SICK, you are not just selecting uncompromising state-of-the-art technology. You acquire much more: Quality that covers the whole process from consultation through commissioning to after-sales service.

User-friendly integration

SICK supports standardized integration in all automation environments: from the relay through safe controls to fieldbus. Use one configuration tool – CDS user interface for all programmable SICK safety products.

Solutions that generate sustainable added value.

How are we able to maintain our position in the industrial safety world after 5 decades at the top?

- By providing safety solutions that support your success.
- By implementing innovative sensor solutions for all important sectors and applications.
- By implementing product development and services that address all requirements.
- By giving you the safety that you need every day.

Is the system safe?
Hazard potential?
Safety distances?
Perimeter access protection?
Area protection?
Hand protection?
Finger protection?
Safety category?

Complete know-how

Knowledge of the specific requirements in a sector is the prerequisite for productive solutions. By means of our application support, you can benefit from our wealth of experience, without this support you would have to build up this know-how.

Comprehensive service

Value-added service.
We place the emphasis on more: Services throughout the entire life cycle of a system. Support during planning, commissioning, maintenance and training.

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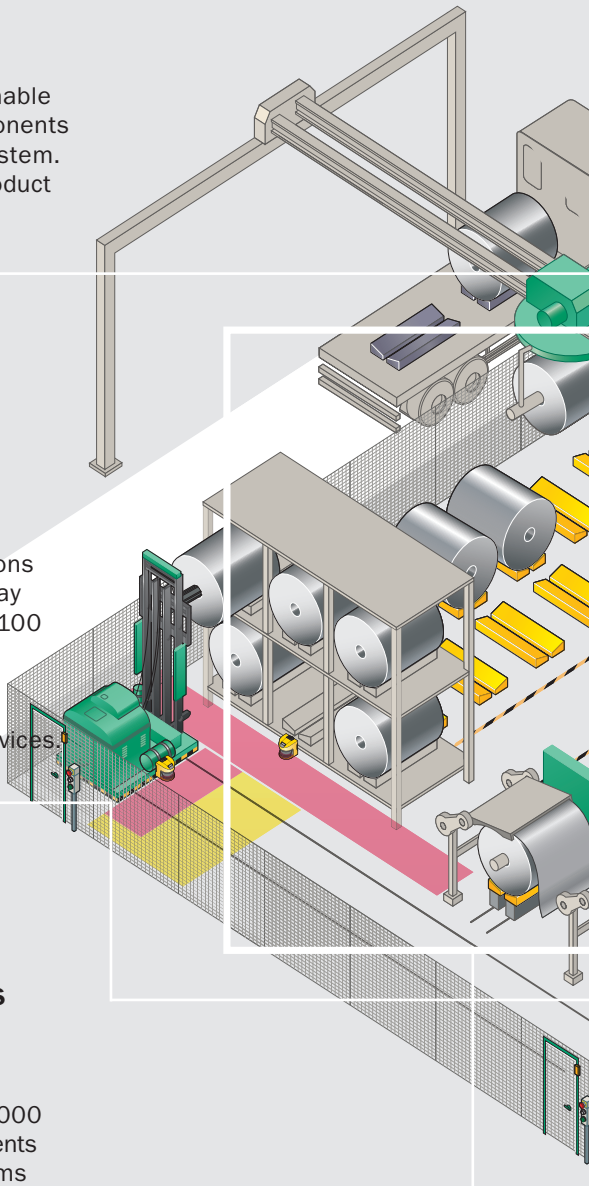
Intelliface connects.

From the simple machine to the complex manufacturing system:
Intelliface interface modules enable you to protect your hazardous areas.
SICK provides the connection, regardless of the complexity of the network.

UE 10 Series

Safety relays

The UE 10 to UE 48 Series Safety Relays enable electromechanical and opto-electronic components to be simply integrated into a machine or system. From emergency stop to laser scanner, 12 product families are available.



UE 100 Series

Safety controllers

UE 100 Series – a series of devices used in stand-alone safety-relevant control applications with moderate complexity. When a safety relay cannot provide enough functionality, the UE 100 Series is the next logical step to fulfill your application requirements. Two dependent or independent applications can be solved using a single UE 100 unit connected to multiple devices.

UE 1000 Series

Safety fieldbus network solutions

UE 1000 Series solutions are designed for machines and systems with high network complexity and programmable controls. UE 1000 Series modules enable safety-relevant components to be integrated and evaluated in bus systems as well as solving complete safety applications.

intelliface

the intelligent interface

Interface modules for all requirements from a single source.

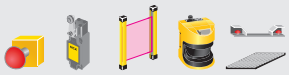
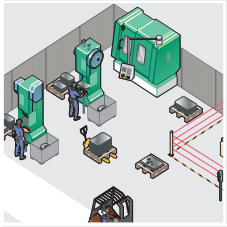
Are you looking for the right interface module for your application?
SICK will provide the flexible solution for all your different requirements.
With our product line, the optimal product for almost every application is available to you – easy to service, easy to use and certified.

For more information, visit our web site:

www.sickusa.com

Safety relays
UE 10 – UE 48 Series

Safety controllers
UE 440/UE 470 Series

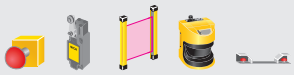
Safety sensor system that can be integrated		
		
Overview of main features		
EN 954-1/ IEC 61508	Up to Cat. 4/–	Cat. 4/SIL 3
Inputs	1- or 2-channel	1 or 2-channel, 15 safety inputs – of which 7 can be 2-channel safety inputs, two ESPE interfaces (Cat. 4)
Safety outputs	2 … 6 relays	2 OSSD pair semiconductor outputs
Application diagnostics output	1 … 4 relays	4 semiconductor outputs
Protection class	IP 20	IP 20
Configuration possibility	–	Drag and Drop Software (CDS)
Added value in the system		
	Mechanical locking (UE 44-3SL)	5 operating modes
	Simple commissioning, short MTTR due to replaceable terminals	Integrated configuration memory: Automatic configuration download on sensor replacement
		Simple configuration via Drag-and-Drop with uniform user software CDS
		Press applications (UE 470)
		Simultaneous protective field evaluation
Applications	**Simple machine** 	**Complex machine**
Products	■ UE 10 to UE 48	■ UE 440, UE 470

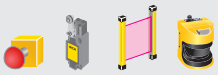
Safety bus modules
UE 4100 PROFIsafe

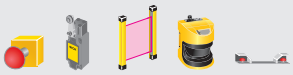
Safety bus modules
UE 4200 AS-i Safety-at-Work

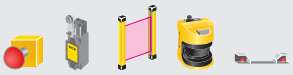
Safety Network Controller
UE 4470 DeviceNet Safety™

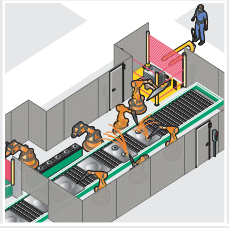
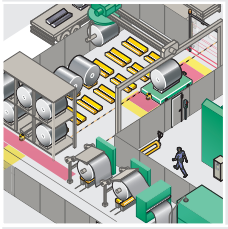
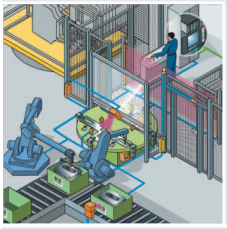
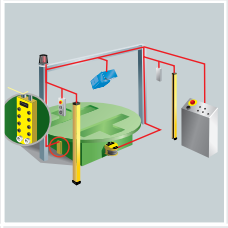
Safety bus modules
UE 4400 DeviceNet Safety™









Cat. 4/SIL 3	Cat. 4/–	Cat. 4/SIL 3	Cat. 4/SIL 3
16 1-channel or 8 2-channel and two communication interfaces for ESPE	1- or 2-channel	16 1-channel or 8 2-channel	6 2-channel (UE 4420, UE 4450) + 2 ESPE interfaces (UE 4450) 2 up to 6 2-channel (UE 4421)
Via PROFIsafe	1 or 2 2-channel relay	8 1-channel or 4 2-channel	2 2-channel bipolar (UE 4420, UE 4450) up to 4 2-channel/2 Relay (UE 4421)
up to 16 (with current monitoring e.g. Muting Lamp)	1 … 2 relays	4 (1 with current monitoring e.g. Muting Lamp)	12 (UE 4420/4450) (2 with current monitoring e.g. Muting Lamps)
IP 67	IP 20 (UE 4231, UE 4232) IP 65 (UE 3212), IP 67 (UE 4215)	IP 20	IP 20 (UE 4421) IP 67 (UE 4420, UE 4450)
Drag and Drop Software	Drag and Drop Software	Drag and Drop Software	Drag and Drop Software
Standard sensors and safety sensors in a network	Standard sensors and safety sensors on a single network	Safety Network Controller for local and remote Safety Inputs and -Outputs	Standard sensors, safety sensors and actuators on a single network
Automatic configuration download and operating mode switching using PLC via PROFIBUS	Easy commissioning because of simple wiring	Logical and application specific function blocks for complete safety automation	Intelligent diagnosis via DeviceNet™ and Standard Human-Machine Interface
Simple configuration with uniform user software CDS local or via PROFIBUS	Easy configuration with Software ASIMON	Local USB port provides access for easy, Windows™-based configuration of the UE 4470 as well as the entire DeviceNet™/DeviceNet Safety™ network.	Windows™-based configuration using SICK CDS software either locally on RS 232 port or via the DeviceNet Safety™ network using configuration applet that embeds directly into the safety network configuration tool.
Diagnostics via PROFIBUS Master class 2	System diagnosis via Software ASIMON	Safety-rated logic controller with network originator/safety master and target/slave connectivity	Safety-rated remote input/output device with network safety target/slave and standard slave connectivity
Simultaneous protective field evaluation via safety PLC			
Network system	**Network system**	**Network system**	**Network system**
			
■ PROFIsafe: UE 4120, UE 4150, UE 4155	■ AS-interface Safety-at-Work: UE 3212, UE 4215, UE 4231, UE 4232	■ DeviceNet Safety™: UE 4470	■ DeviceNet Safety™: UE 4420, UE 4450, UE 4421

UE 10 to UE 48 Series Safety Relays.

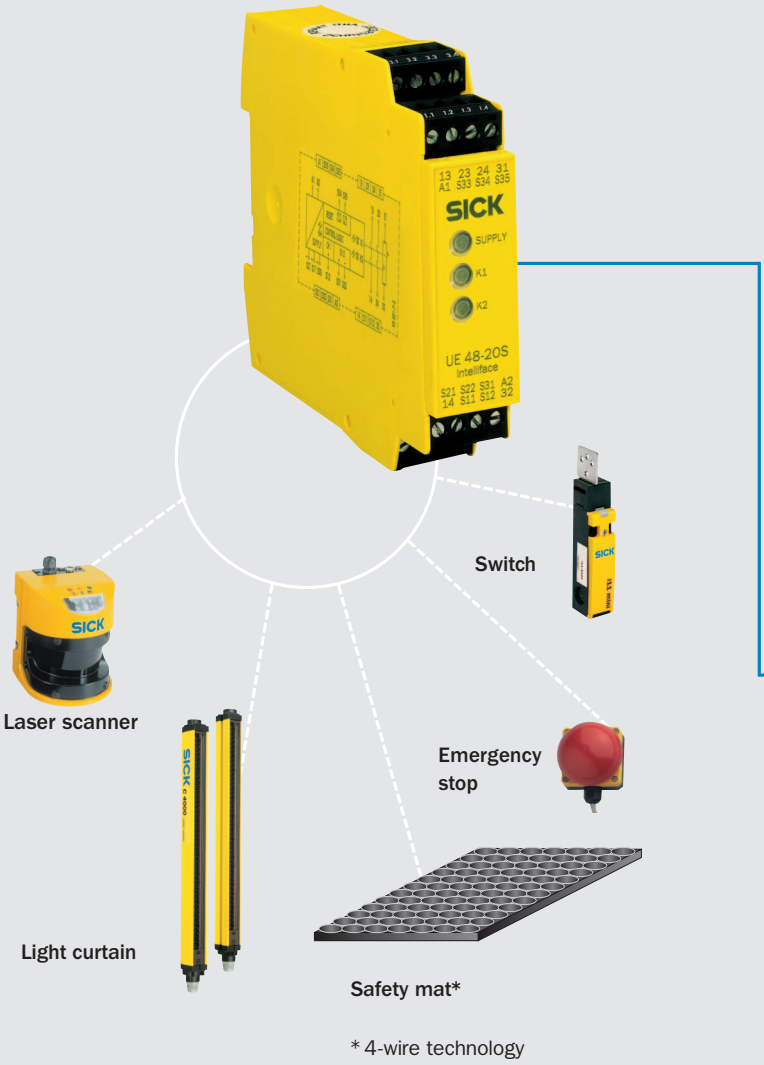
Using the UE 10 to UE 48 Series Safety Relays, individual electromechanical and opto-electronic safety components can be easily integrated into a machine. 12 family groups from emergency stop to laser scanners are available.

Product example UE 48: Safety relay suitable for five sensor types

Instead of using a special relay for emergency stop, switches, safety mats, light curtains or laser scanners, the UE 48 can evaluate each of these safety components up to Category 4.

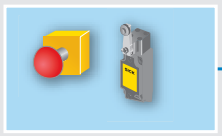
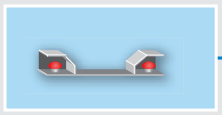
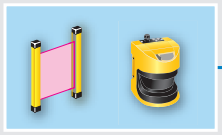
System and user advantages

- Specially developed for SICK light curtains and laser scanners
- High safety, availability and service life
- Coded plug-in terminals reduces installation and replacement costs.
- Compact, space saving design
- Can be used up to Category 4 in accordance with EN 954-1



* 4-wire technology

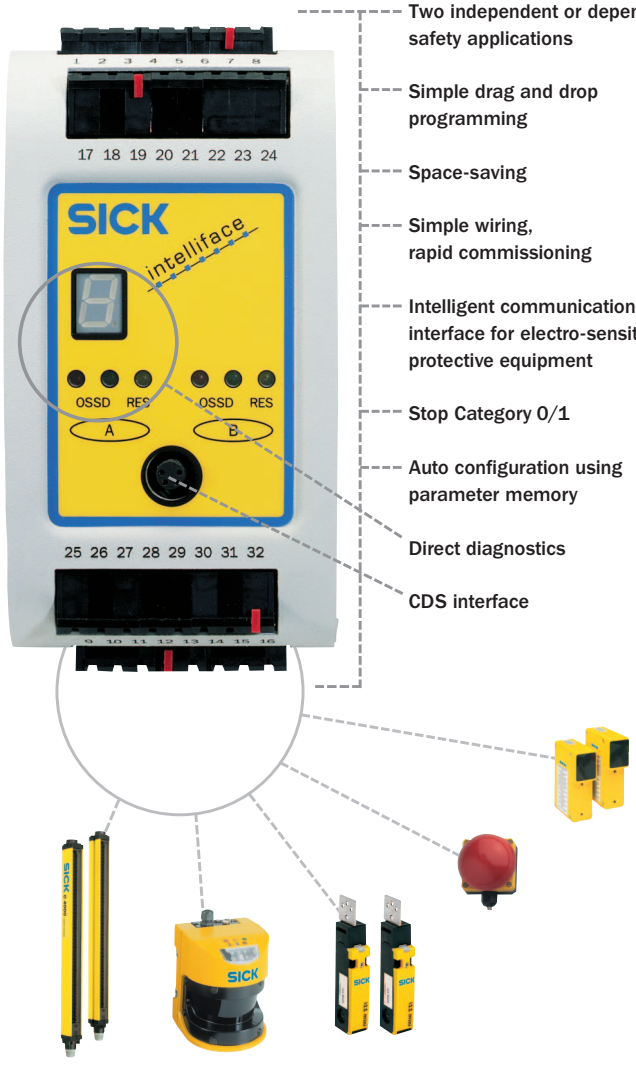
UE 10 to UE 48 – selection made easy

Main application	Input circuit	Features		UE device
	single-channel		2/1	UE 23-2 MF
	two-channel	Stopping cat. 0	2/1	UE 43-2 MF
			3/1	UE 43-3 MF
			6/4	UE 43-6 MF
		Stopping cat. 1	3/0	UE 45-3 S1 2 3 1 output up to 3 s off-delayed
			3/0	UE 45-3 S1 2 30 1 output up to 30 s off-delayed
1)	two-channel	Stopping cat. 0	3/0	UE 44-3 SL 2 3 1 output up to 3 s on-delayed
			3/0	UE 44-3 SL 2 30 1 output up to 30 s on-delayed
	two-channel	Stopping cat. 0	2/1	UE 42-2 HD
	two-channel	Stopping cat. 0	3/1	UE 10-3 OS
	two-channel	Stopping cat. 0	2/1	UE 48-2 OS
			3/0	UE 48-3 OS
Expansion module			4/2	UE 10-4 XT
			4/2	UE 11-4 DX off-delayed 0.5, 1, 2 or 3 s

1) Safety switches with mechanical locking

Configurable safety controllers of the UE 100 Series.

The UE 100 Series is used for machines and systems with moderate control complexity. If you require more safety-relevant control flexibility than safety relays can provide, the UE 100 Series may be the right solution for you.



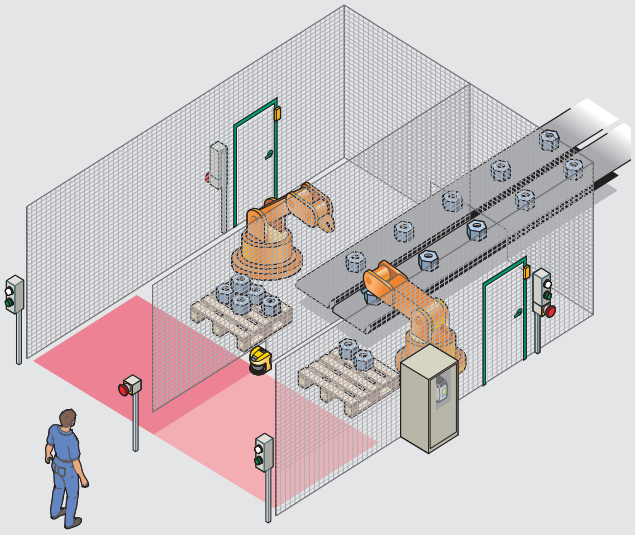
UE 440/UE 470 features

- Two intelligent interfaces up to SIL 3/Category 4 for SICK C 4000 and S 3000 Safety Systems
- 15 single channel safety-capable inputs may be configured for single channel or dual channel evaluation
- Two semiconductor safety-capable output pairs up to Category 4 are supported with separate external device monitoring (EDM) inputs and reset
- Supports Stop Category 0 and Stop Category 1

System and user advantages

- **Easy to service and maintain due to uniform configuration and diagnostics for device and connected intelligent sensors, e.g. S 3000 and C 4000**
- **Simple user-friendly logic programming via Windows™-based drag and drop Software**
- **Reduced wiring effort due to logical linking of safety sensors (AND, OR, NAND ...)**
- **Simple replication of the application by uploading and downloading data sets**
- **Secure against tampering due to multiple password levels**
- **Function expansion for intelligent SICK sensors (simultaneous protective field monitoring S 3000)**
- **Fast reaction time (≤ 10 ms): optimization of the safety distances between man and machine**

Universal application with UE 440



Handle two separate application solutions using only one UE 440.

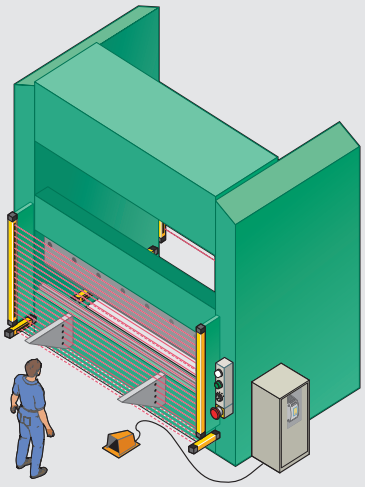
Simultaneous hazardous area monitoring with UE 440

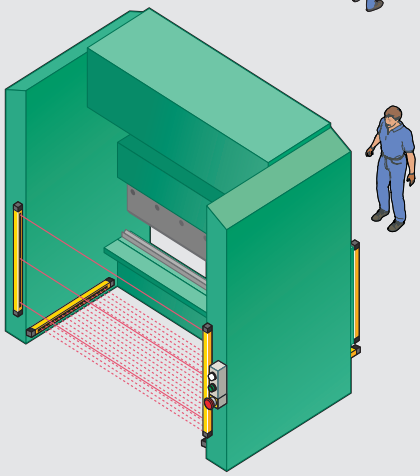
The hazardous areas on two robot cells are secured using a UE 440 Safety Controller in conjunction with an S 3000 Safety Laser Scanner. For this purpose two safety applications are configured in the UE 440.

The S 3000 monitors the two hazardous areas with two simultaneous protective fields. When there is an object in one of the protective fields, the monitored semiconductor outputs for the related safety application are shut down. The side access doors to the robot cells are monitored by safety door switches. The emergency stop function and the reset function are also realized using the UE 440.

Special applications with UE 470

Access and hazardous area protection using safety controller for presses UE 470.





The access to the press from the rear is protected using an M 2000 Perimeter Guard in conjunction with a C 2000 Safety Light Curtain. This M 2000/C 2000 Host-Guest system detects persons that may enter or be present within the safeguarded area.

Hydraulic and eccentric presses with UE 470

- Certified safety function blocks, e.g. single break, double break, protective operation
- Evaluation of signals related to pressing action: Top dead center (TDC), bottom dead center (BDC), stop control contact (SCC)

Application example: Press protection

The hazardous point on a press is protected using a UE 470 Safety Controller with a C 4000 Safety Light Curtain.

All signals directly related to pressing action, such as TDC, BDC and SCC are evaluated. The press is shut down depending on intrusion of the safety sensors connected.

For the safety application, the indication of PSDI, “reset required,” reset, EDM and emergency stop are configured in the UE 470.

UE 1000 Series Safety Bus Modules.

The UE 1000 Series Safety Bus Modules enable safety-relevant components to be interfaced to the fieldbus systems PROFIBUS, PROFIsafe, DeviceNet™, DeviceNet Safety™ and AS-interface.

System and user advantages

- **For safety tasks up to Category 4 (EN 954) or SIL3 (IEC 61508)**
- **For safety automation without control cabinet design to IP 67 or IP 65**
- **Open device technology for connecting different sensor systems**
- **Optimized connection for SICK electro-sensitive protective equipment**
- **Seamless configuration and diagnostics for sensors as well as bus modules**

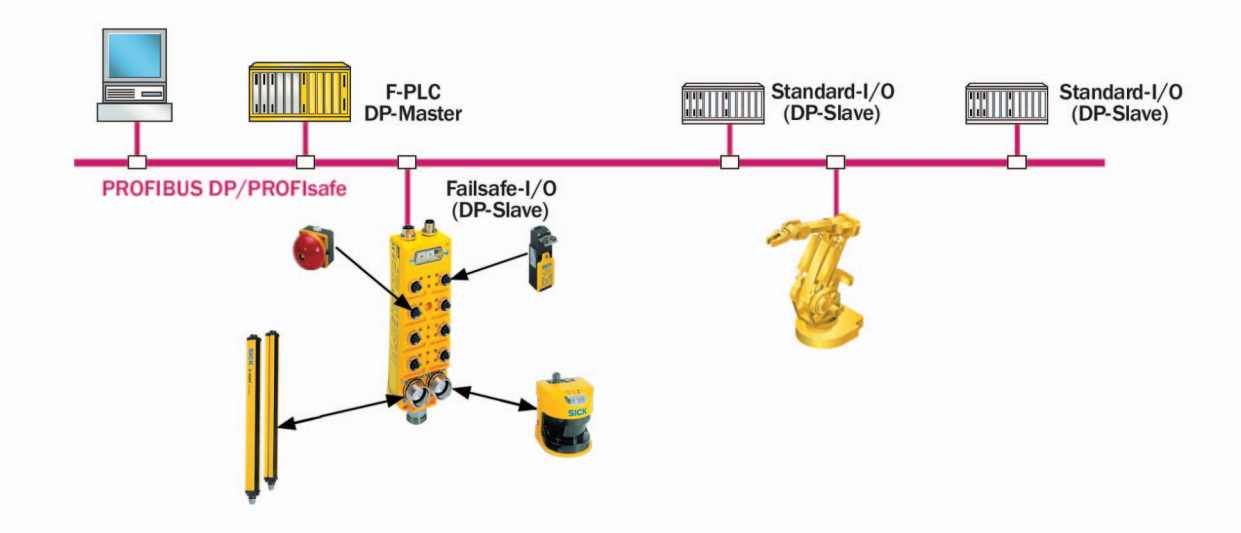
Applications

- For decentralized interfacing of safety-relevant components in networked systems

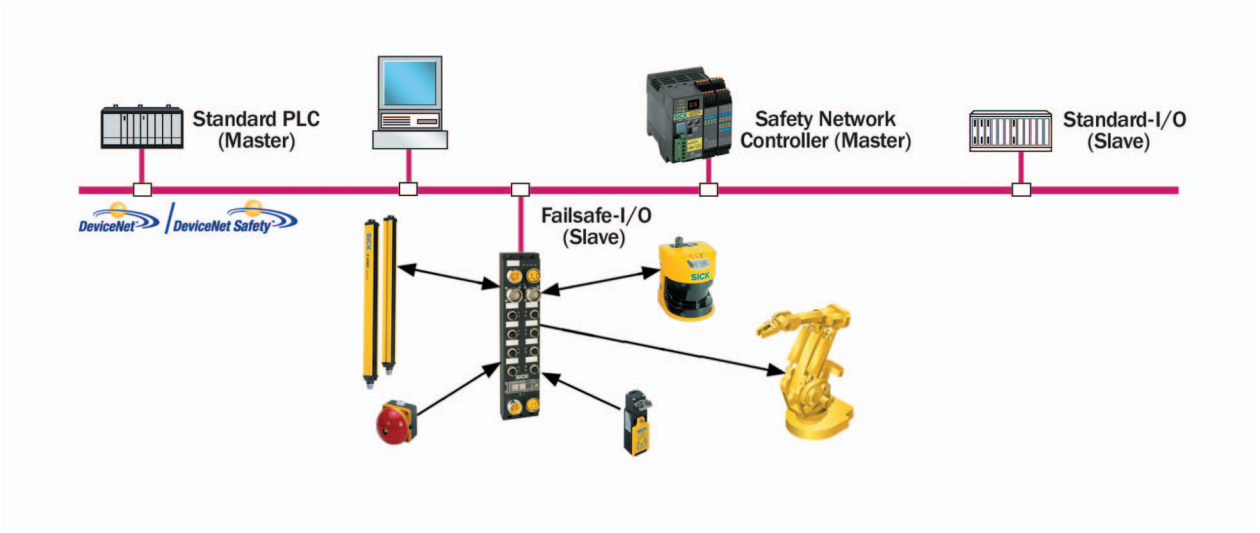
Products

- PROFIsafe
  - UE 4120; UE 4150; UE 4155
    Remote bus module in IP 67
- DeviceNet Safety™
  - UE 4421 – Remote bus module in IP 20
  - UE 4420; UE 4450 – Remote bus module in IP 67 for sensors with contacts and ESPE and safety actuators
  - UE 4470 – Safety Network Controller for logic evaluation of local and remote safety related signals
  - SICK DeviceNet Safety™ Configurator safety network configuration software
- AS-interface Safety-at-Work
  - UE 3212; UE 4215
    De-central bus connection in IP 65/67
    For sensors fitted with contacts and ESPE
  - UE 4231; UE 4232
    Safety monitors for the evaluation of the safety-relevant signals

Easy communication in PROFIBUS Networks



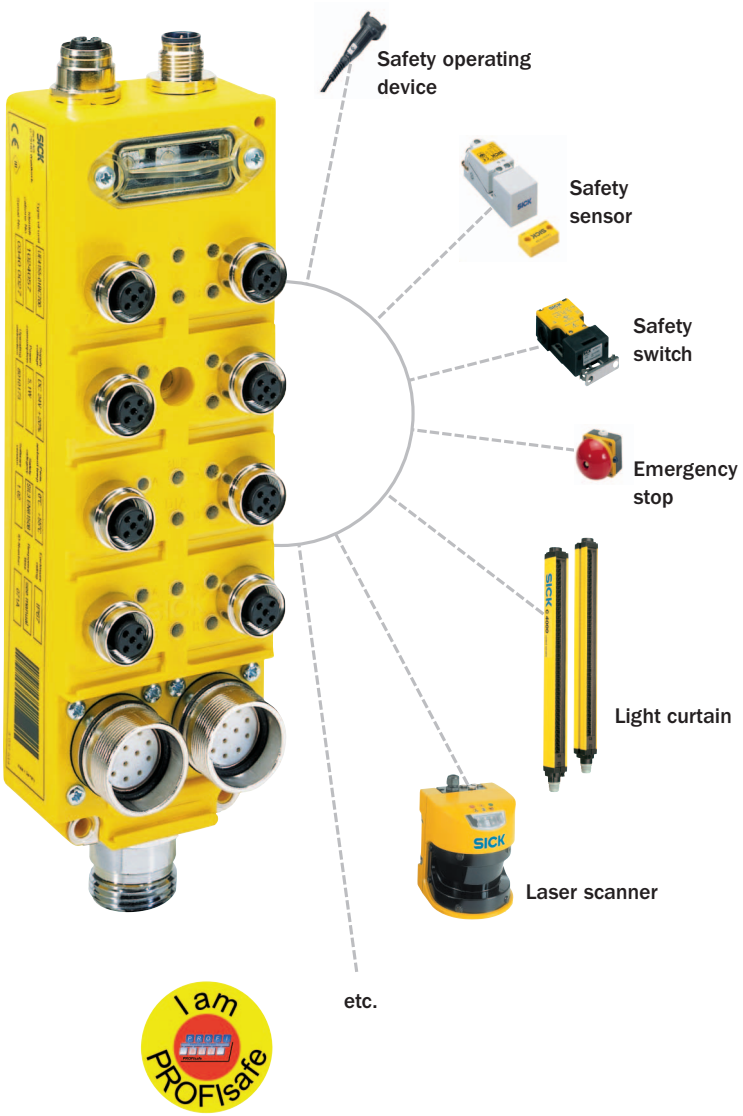
Seamless solution by SICK with the example of DeviceNet™



Seamless solution by SICK with the example of AS-interface

Configurable PROFIsafe products in the UE 4100 Series.

PROFIsafe is an extension of the PROFIBUS DP protocol for safety technology. In the case of PROFIsafe, the communication between the PROFIsafe slaves and the PROFIsafe master is protected against transmission errors and changes.



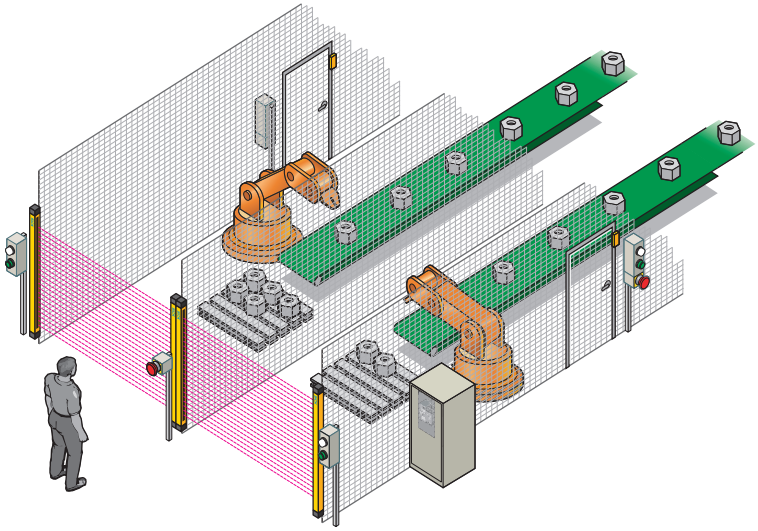
UE 4100

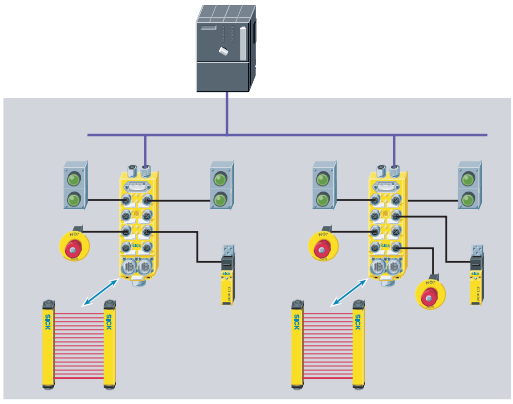
UE 4100 PROFIsafe is not only a remote I/O fieldbus node of IP 67 design for the connection of "classic" safety components to the PROFIsafe fieldbus system, but also an intelligent remote communication interface to complex safety components, e.g. C 4000 and S 3000.

System and user advantages

- For safety tasks up to Category 4 (EN 954) or SIL 3 (IEC 61508)
- IP 67 design for safety automation without control cabinet
- Reduced wiring effort
- Safety Data Link (SDL): Optimized connection for safety devices such as C 4000 and S 3000
- Uniform configuration and diagnostics for bus nodes and sensors using CDS
- Configuration and diagnostics on the components via PROFIBUS

Application example: Two independently protected robot cells with PROFIsafe





Series UE 4100 PROFIsafe Bus Nodes

Common features of the UE 4120 and UE 4150/UE 4155

- 8 field signal connections to connect active and passive safety components up to Safety Category 4
- Convenient configuration and diagnostics using the Windows™-based SICK CDS (Configuration & Diagnostic Software)
- Offline configuration of the system without fail-safe PLC is possible
- Support for PROFIsafe V1.20 10/2002
- Support for PROFIBUS DP V1: Cyclic communication with DP-Master Class 1 (central control)
  Acyclic communication with DP-Master class 2 (configuration and diagnostics tool)

Additional features of the UE 4150

- 2 SDL connections for S 3000 and C 4000
- Configuration and diagnostics on the components connected to the SDL connection

Additional features of the UE 4155

- 2 SDL connections for S 3000 and C 4000
- Usage of the expanded functions safety sensors on the SDL, e.g. operating mode selector switch for C 4000 or protective field switching for S 3000
- Configuration and diagnostics on all components connected to the SDL connection
- Expansion of the functions with function packages for cross-routing between bus nodes and C 4000 or S 3000 (e.g. decentralized protective field switching by means of the direct connection of a selector switch to the bus node and cross-routing to the S 3000)

Components that can be connected:

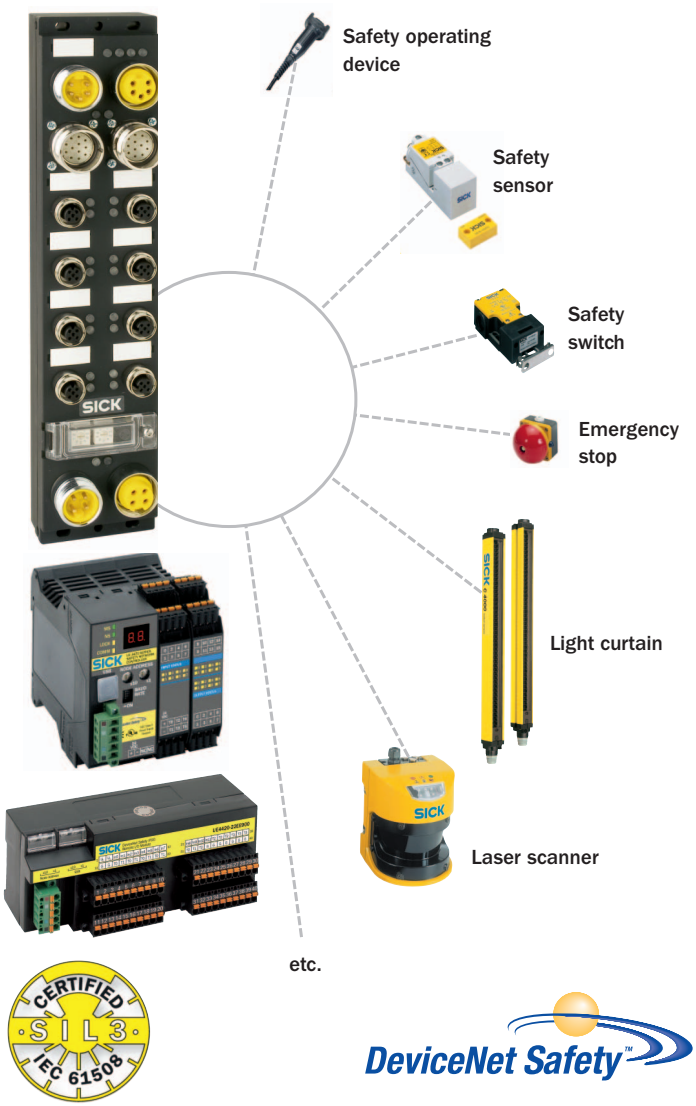
- Electro-sensitive protective equipment (ESPE)
- Emergency stop button
- Electromechanical safety switches
- Safety operating devices
- Control switches with lamps
- Operating mode selector switch
- Muting sensors
- Muting lamp

Example applications:

- Bodyshell manufacture and final assembly in the automotive industry
- Robot cells
- Storage and conveyor systems

UE 4400 Series programmable and configurable products for DeviceNet Safety™

DeviceNet Safety™ incorporates safety-rated functionality into the DeviceNet™ fieldbus architecture. The DeviceNet Safety™ product portfolio from SICK includes safety programmable devices as well as remote I/O bus nodes supporting complete safety automation of machinery and manufacturing processes.



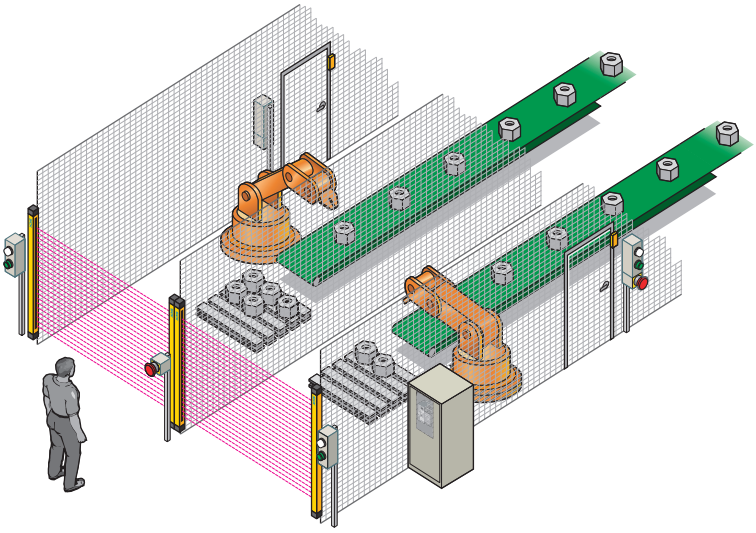
UE 4400

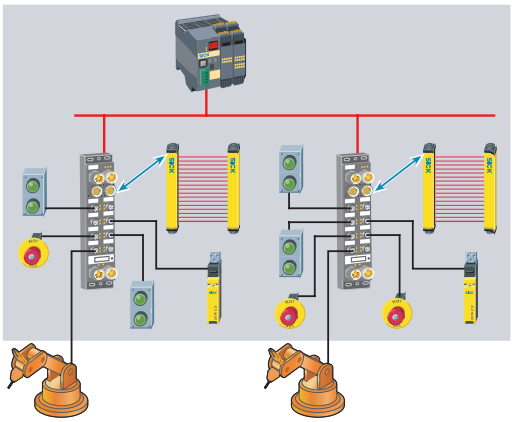
The UE 4400 DeviceNet Safety™ product portfolio includes all of the components needed to implement a safe automation system. The system supports both standard and safety capable inputs and outputs. Additionally, the UE 4450 Series remote I/O devices support the Safety Data Link (SDL) communication with SICK intelligent safety devices such as C 4000 Series Safety Light Curtains and Safety Laser Scanners

System and user advantages

- For complete safety applications up to Category 4 (EN 954) and SIL 3 (IEC 61508)
- IP 67 bus node version for distributed safety automation without control cabinet
- Reduced wiring compared to point-to-point hard-wired safety systems
- Safety Data Link (SDL): Optimized connection of intelligent C 4000 safety light curtain and S 3000 safety laser scanner.
- Standardized software for programming, configuring and diagnosing controllers, bus nodes including connected sensors and the network.
- Device programming, configuration, and diagnostics can be communicated via the DeviceNet™/DeviceNet Safety™ network

Application example: Two independently protected robot cells with DeviceNet Safety™





Modular System for DeviceNet Safety™

- Complete line of products for safety automation up to Category 4 (EN 954) and SIL 3 (IEC 61508) of machinery and manufacturing process
- Supports the upgrade of standard DeviceNet™ to DeviceNet Safety™
- Seamless and comfortable configuration and diagnosis of both standard and safety-rated devices or the system and the network using Windows™-based software
- Offline configuration of the system without the need for a safety PLC
- Decentralized evaluation of both standard and safety sensors and actuators
- Easy integration of intelligent sensors e. g. C 4000 Safety Light Curtain and S 3000 Safety Laser Scanner

UE 4421 IP 20 Remote I/O Bus Node Product Family

- Provision of safety capable inputs and safety capable outputs with IP 20 enclosure for DIN Rail, panel mounting
- Only one fieldbus address is required for up to 16 sensors or actuators
- Easy upgrade of standard DeviceNet™ to DeviceNet Safety™ using the installed base of sensors or actuators
- Easy installation utilizing spring clamp-style, pluggable terminal blocks
- Safety capable outputs available as solid state or relay contacts

UE 4420/4450 IP 67 Remote I/O Bus Node Product Family

- Provision of safety capable inputs and safety capable outputs with rugged IP 67 enclosure for field-based mounting without the need for control cabinets
- Only one safety field bus address is required for up to 14 sensors or actuators
- Easy upgrade of standard DeviceNet™ to DeviceNet Safety™ using the installed base of sensors or actuators
- Easy Installation utilizing standard connectors (e. g. M12 and mini)
- Easy connection of intelligent sensors, like C 4000 Safety Light Curtains or S 3000 Safety Laser Scanners

UE 4470 IP 20 Safety Network Controller Product Family

- Safety automation with full complement of third-party certified logical and application- specific function blocks
- Decentralized evaluation and logical combination of safety sensors and actuators
- Supports both local and remote connections to safety sensors and actuators
- Easy installation utilizing spring clamp-style, pluggable terminal blocks
- Remote Configuration of other DeviceNet Safety™ devices through local port via DeviceNet Safety™ Network

Series UE 4200 Safety Bus Modules for AS-interface Safety-at-Work

AS-interface products in the UE 4200 Series facilitate the easy integration of protective devices into an existing or new AS-interface network. Existing AS-interface applications can therefore be extended with safety-relevant functions.

UE 4200

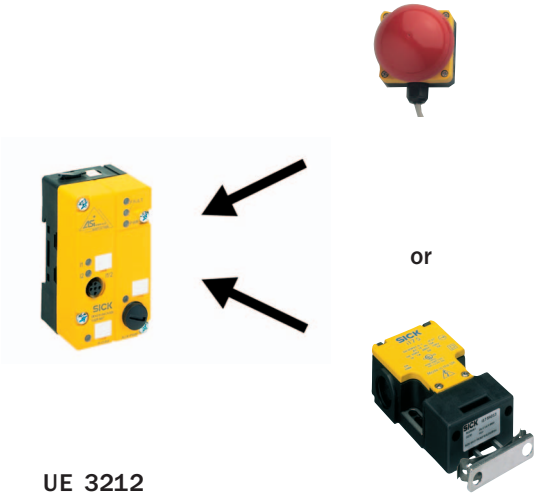
The modules for the UE 4200 AS-interface Safety-at-Work provide connection options for a wide range of electro-sensitive protective equipment as well as for electromechanical safety sensors. With AS-interface Safety-at-Work Safety Monitors, the safety-related signals are evaluated in the AS-interface network.

System and user advantages

- **Standardized solution for AS-interface and AS-interface Safety-at-Work**
- **For safety applications to Category 4 (EN 954)**
- **Bus circuit in IP 65 or IP 67 for decentralized safety automation without control cabinets**
- **Connection for different safety light curtains and scanners to AS-interface Safety-at-Work via UE 4215**
- **Connection for E-stop and electromechanical safety switches to AS-interface Safety-at-Work via UE 3212**
- **AS-interface Safety-at-Work Safety Monitors with one or two safety rated outputs (UE 4231/UE 4232)**

Safe integration of safety sensors and electromechanical safety devices with AS-interface Safety-at-Work

UE 4215



UE 3212

UE 4215 Safe Bus Node:

- Connection for electro-sensitive protective equipment (ESPE) with self-monitoring (tested) semiconductor outputs
- Connection for the supply of the sender for an ESPE system
- For field use IP 67

A few possible applications in conjunction with various safety components:

- Hazardous point protection, e.g. with SICK C 4000
- Access protection, e.g. with SICK M 4000
- Hazardous point protection and access protection, e.g. with SICK C 2000/M 2000
- Area protection, e.g. with SICK PLS, S 3000 safety laser scanners

UE 4231/UE 4232 Safety Monitors:

- Evaluation of the safety-relevant signals in the AS-interface Safety-at-Work network.
- Can use multiple safety monitors in a single AS-interface Safety-at-Work network

Example applications for AS-interface Safety-at-Work:

- Packaging machines
- Foodstuff machines
- Conveyor systems for individual items and bulk goods
- Machine tools
- Extensive machines with several control elements and safety sensors for machining wood and metal

Safe bus node UE 3212:

- Connection for 1 or 2-channel electromechanical sensors
- For field use IP 65

Some examples of components that can be connected:

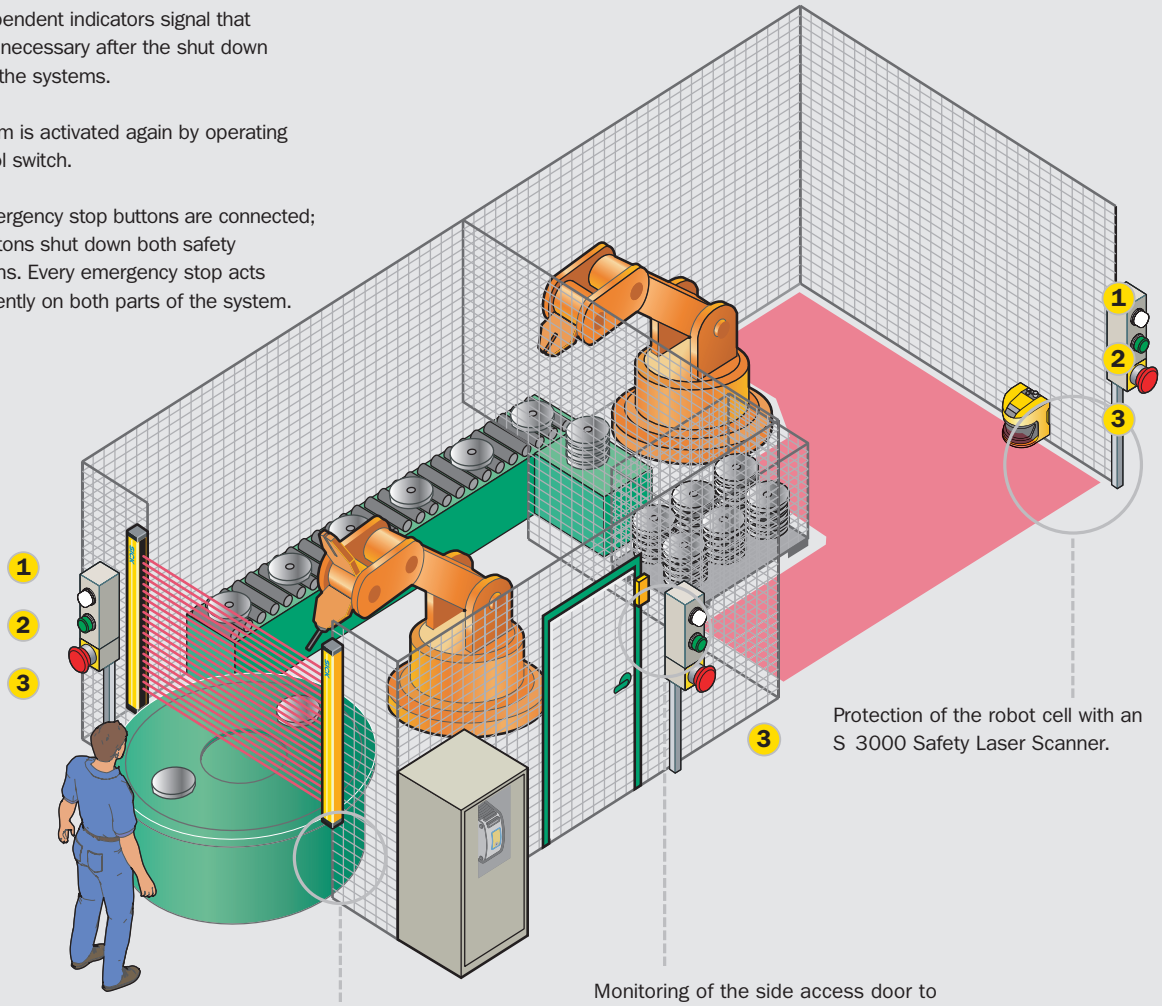
- Emergency stop button
- Safety switches
- Position switches

One application – three solutions.

Intelliface interface products make it possible to realize different system solutions within one and the same application.

Application example: Production area with two independently protected robot cells.

1. Two independent indicators signal that a reset is necessary after the shut down of one of the systems.
2. The system is activated again by operating the control switch.
3. Three emergency stop buttons are connected; these buttons shut down both safety applications. Every emergency stop acts independently on both parts of the system.



Protection of the robot cell with an S 3000 Safety Laser Scanner.

Protection of the hazardous point on the turntable on a robot cell using the C 4000 Safety Light Curtain.

Monitoring of the side access door to the front robot cell by a safety switch. This switch shuts down the dangerous movement when the guard is opened. A restart interlock is configured for both safety applications.

Solution 1: UE 10 – UE 48 Series

UE 48-2 OS:

With the UE 48-2 OS, safety components for the robot cells can be connected individually.

The safety relay monitors the laser scanner, the light curtain, the emergency stop buttons and the safety switch on the guard with one device type. Restart interlock and external device monitoring can also be provided with the UE 48-2 OS.

Solution 2: UE 100 Series

UE 440:

Both safety applications can be realized with the UE 440. The safety applications are prepared conveniently using drag and drop configuration with the CDS software.

Each part of the system shuts down the dangerous movement of the related robot depending on the state of its inputs (C 4000, S 3000, safety switch). The emergency stop buttons operate independently in the system. After an emergency stop, each part of the system must be reset before the related part can be started again.

Solution 3: UE 1000 Series

UE 4100 PROFIsafe

One UE 4155 is used for each part of the system. All safety-relevant signals for each robot cell are acquired via the bus circuit. The bus nodes UE 4155 are configured for the devices connected, such as the emergency stop buttons, laser scanner, light curtain, reset, etc. using the SICK CDS User Interface.

Both bus nodes are simply integrated as slaves to the PLC with one PROFIBUS address each. The monitoring and functional control of the two parts of the system is performed via the safety PLC.

UE 4200 AS-interface Safety-at-Work

To solve the application described with AS-interface Safety-at-Work, two UE 4232 Safety Monitors would be used. One for each part of the system.

To interface the C 4000 Light Curtain and the S 3000 Safety Laser Scanner, UE 4215 Safe Bus Nodes are used. The safety switch and the emergency stop buttons are integrated in the AS-interface network using the UE 3212 safe bus nodes.

UE 4400 DeviceNet Safety™

At each part of the application, one UE 4450 bus node pre-evaluates all relevant safety and standard signals and communicates the corresponding data via DeviceNet Safety™ to a UE 4470 Safety Network controller. The UE 4470 solves the complete safety application, using logical and application specific function blocks.

The resulting safety relevant output signals are transmitted via DeviceNet Safety™ to the UE 4450, safely switching off the robot cells. The system offers full diagnostic information, e.g. for evaluation in standard controllers or display at Human Machine Interface terminals.

Main features UE 10 and UE 100.

Main features UE 10 to UE 48.

Main features series UE 10 - UE 48

	General			Applications					Contacts				Functions							
	Safety Category in compliance with EN 954-1	Basic device	Expansion module	Emergency stop button (EN 418)	Safety switches (EN 1088)	Two-hand controls (Type III C/EN 574)	Safety mats (only 4-wire technology)	Opto-electronic protective devices (Type 2, 3, 4)	Enable current paths	Signalling current paths	Enable current paths on-delayed	Enable current paths off-delayed	1-channel operation	2-channel operation	Cross circuit detection	Automatic reset	Manual reset (monitored)	Concurrence monitoring (0.5 s)	Synchronous time monitoring (0.5 s)	Housing width (mm)
UE 42-2 HD	4	x	-	-	x	x	-	-	2	1	-	-	-	x	-	x	-	x	-	22.5
UE 23-2 MF	2 [1]	x	-	x	x	-	-	-	2	1	-	-	x	-	-	x	x	-	-	22.5
UE 43-2 MF	4	x	-	x	x	-	-	-	2	1	-	-	x	x	x	x	x	-	x	22.5
UE 43-3 MF	4	x	-	x	x	-	-	-	3	1	-	-	x	x	x	x	x	-	x	45
UE 43-6 MF	4	x	-	x	x	-	-	-	6	4	-	-	x	x	x	x	x	-	x	90
UE 10-3 OS	[2]	x	-	-	-	-	-	x	3	1	-	-	-	x	-	-	-	-	-	22.5
UE 48-2 OS	4	x	-	x	x	-	x	x	2	1	-	-	x	x	x	x	x	-	-	22.5
UE 48-3 OS	4	x	-	x	x	-	x	x	3	0	-	-	x	x	x	x	x	-	-	22.5
UE 44-3 SL	4	x	-	x	x	-	-	-	2	-	1	-	x	x	x	x	x	-	x	22.5
UE 45-3 S1	4	x	-	x	x	-	-	-	2	-	-	1	x	x	x	x	x	-	x	22.5
UE 10-4 XT	[3]	-	x	-	-	-	-	-	4	2	-	-	-	-	-	-	-	-	-	22.5
UE 11-4 DX	[3]	-	x	-	-	-	-	-	-	-	-	4/2 [4]	-	-	-	-	-	-	-	22.5

[1] The connected control switch and the following control as well as the wiring and laying of the wiring must comply with the control category
[2] As per protective device
[3] As per basic device
[4] 4 normally open/2 normally closed contacts off-delayed

Main features
UE 100 Series

UE 440/UE 470 main features												UE 470		
Inputs												Signals related to pressing actions		
Max. 15	Operating modes	Two-hand control	Single-channel input	Two-channel input	E-stop single-channel	E-stop two-channel	AOPD	Reset	External device monitoring	Teach-in key-operated switch	Key-operated pushbutton for bypass	Bottom dead center	Top dead center	Stop control contact
Max. number	5	2	15	7	2	2	7	2	2	1	2	1	1	1

Outputs						
Max. 8	OSSD	Test pulse outputs	Reset lamp	Bypass lamp	Signal output (HIGH-active)	Signal output (LOW-active)
Max. number	2 pairs	2	2	2	8	4

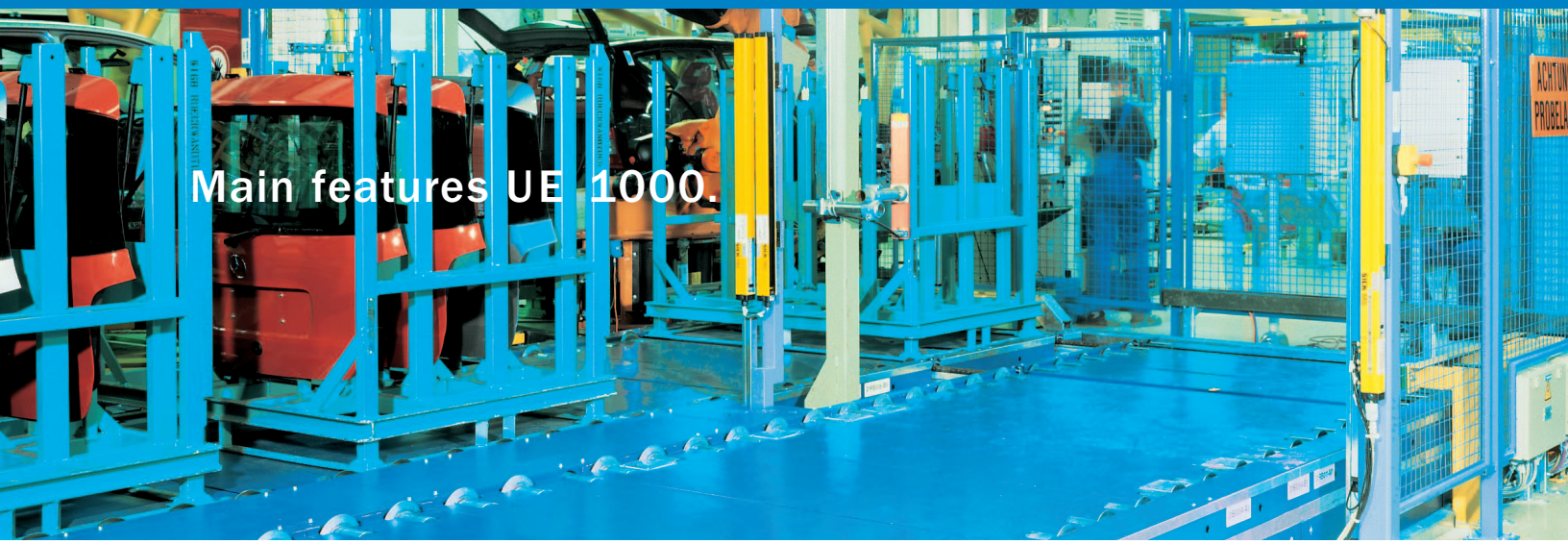
Number of communication interfaces (EFI) to SICK sensors		
Max. 2	C 4000 (EFI)	S 3000 (EFI)
Max. number	2	2

UE 440/UE 470 main features	
Supply voltage	24 V DC
Voltage tolerance	± 20 %[1]
Residual ripple (within the supply voltage limits)	≤ 10 %
Maximum power consumption	4.5 A
Protection class	III (safety extra-low voltage)
Response time	< 10 ms
Input delay (adjustable)	0…90 ms
Discrepancy time on the inputs (adjustable)	0…30 s
Enclosure rating	IP 20
Dimensions (W x H x D)	65 x 120 x 100 mm³

1) Reverse polarity protected via safety transformer in accordance with EN 60742

	Applications/Functions								
Control category/safety integrity level according to EN 954-1/IEC 61508	Emergency stop	Safety switch	Opto-electronic protective device	External device monitoring (EDM)	Manual reset	Automatic reset	Signals related to pressing actions[1]	Expanded functions through the use of the safe SICK device communication[2]	**Product**
Category 4/SIL 3	✓	✓	✓	✓	✓	✓	–	✓	UE 440
	✓	✓	✓	✓	✓	✓	✓	✓	UE 470

1) Bottom dead center, top dead center and stop control contact
2) Enhanced function interface, safe SICK device communication



Main features UE 1000.

Main features
UE 4100 PROFIsafe.

Main features series UE 41xx			
Enclosure rating (IEC 60529)	IP 67		
Safety category	Category 4 (EN 954), SIL 3 (IEC 61508)		
Internal processing time	6 ms		
	Minimum	**Typical**	**Maximum**
Field signal inputs			
Input voltage[1] HIGH	11 V	24 V	28.8 V
Input delay (configurable)	0 ms		90 ms
Field-signal outputs			
When status is 'switched-on'			
Output voltage HIGH (without load)	Uv		
Switching current	0 mA		700 mA
Minimum current for fault monitoring on field-signal connections 7 and 8[2]	7 mA	20 mA	40 mA
SDL connections			
Power supply			
Current			1.4 A
Internal resistance			0.3 Ω
OSSD inputs			
Input voltage HIGH	13 V	24 V	28.8 V
PROFIBUS connection			
Baud rate	9.6 kBit/s		12 MBit/s
Address range	3		125
Manufacturer's code			
UE 4120	070F hex		
UE 4150/UE 4155	071A hex		
Operating data			
Supply voltage U_V at device[3]	19.2 V	24 V	28.8 V
Power consumption through power-supply connection			9 A

1) In compliance with IEC 61131-2, Type 2

2) Only when the connection is configured as an output for a muting lamp

3) The external voltage supply must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1

Main features
UE 4200 AS-interface Safety-at-Work.

Main features		UE 3212	UE 4215
Supply voltage U_V[1]	DC 26.5 ... 31.6 V	x	x
Total power consumption	60 mA	x	x
Safety data		-	-
Safety category (EN 954)		3	4
Response time		6	22
Safe inputs		x	x
Input circuit	PNP	-	x
	PNP/NPN	x	-
Current loading[2]	200 mA	-	x
Short-circuit detection		x	x
Short-circuit protected		x	x
Switching level HIGH signal	> 10 V	-	x
Input current HIGH/LOW	> 5 mA/< 1.5 mA	-	x
External supply			
External voltage supply[3]	DC 24 V via ribbon cable	-	x
Current load per module	1.2 A	-	x
Interface for AS-interface	Reverse polarization protection	x	x
AS-interface profile	S-7.B.0	x	-
	S-0.B.E	-	x
AS-interface specification	2.1	x	x
Product standard/EMC	EN 50295	x	x
Enclosure rating in compliance with EN 60529	IP 65	x	-
	IP 67	-	x
Ambient temperature	Operation: –25 ... +70 °C	-	x
	Operation: –25 ... +65 °C	x	-
Display LED yellow	Input signals	x	x
LED green	AS-i voltage indication	x	x
LED red	Fault	x	x
Addressing	Via IR interface	x	x
Housing material	PBTP (Pocan)	x	x
Weight	85 g	-	x
	100 g	x	-
Connection to AS-interface	Via contact pins[4]	x	x
Safety sensors that can be connected	Electromechanical safety sensors	x	-
	Electro-sensitive protective equipment (ESPE) with self-monitoring semiconductor outputs (OSSD)	-	x

Main features		UE 4231	UE 4232
Configuration interface	RS 232	x	x
Supply voltage U_V[1]	DC 24 V +/–15%	x	x
Power consumption	150 mA	x	-
	200 mA	-	x
Switch on delay	< 10 s	x	x
Safety data			
Safety category (EN 954)	4	x	x
Response time	< 40 ms	x	x
AS-interface data			
AS-interface profile	Monitor 7.F	x	x
Voltage range	18.5 ... 31.6 V	x	x
Power consumption	< 45 mA	x	x
Safety switching outputs	Floating normally opened contacts	x	x
Enable circuits	1 output pair	x	-
	2 output pairs	-	x
Max. contact load	1 A DC13 at DC 24 V	x	x
	3 A AC15 at DC 230 V	x	x
Continuous current	3 A per output circuit	x	x
Housing			
Enclosure rating in compliance with EN 60529	Housing IP 20	x	x
Fastening	Snap-in fastening for mounting rail as per EN 50022	x	x
Weight	350 g	x	-
	450 g	-	x
Operating temp.	–20 ... +60 °C	x	x

[1] In compliance with AS-interface specification
[2] For all inputs in total
[3] In accordance with PELV via AS-interface ribbon cable
[4] On FK or FKE base or FK-A or FKE-A base

For accessories, see technical description "SENSICK AS-i components" (8009362)

Main features UE 1000.

Main Features	UE 4470 Safety Network Controller	UE 4400 IP67 Remote Input/Output Bus Node	
Model designation	UE4470-22EE690	UE4420-03DC9F0	UE4450-03DC9F0
Part number	1 028 312	1 028 302	1 028 305
Safety category (accord. EN 954-1)	To Category 4	To Category 4	To Category 4
Safety integrity (accord. IEC61508)	To SIL 3	To SIL 3	To SIL 3
Power requirements (U_{Lx}, U_S)	20.4…26.4 V DC	19.2…28.8 V DC	19.2…28.8 V DC
Connection type	Terminal block	4-Pole MINI connector male and female	4-Pole MINI connector male and female
Operating temperature	14…131°F (-10…+55°C)	14…131°F (-10…+55°C)	14…131°F (-10…+55°C)
Enclosure rating	IP 20	IP 67	IP 67
Protection class (accord. IEC 61131-2)	III	III	III
Vibration (accord. IEC 60068-2-6)	0.35mm : 10-57 Hz, 50 m/s² : 57-150 Hz	0.35mm : 10-57 Hz, 50 m/s² : 57-150 Hz	0.35mm : 10-57 Hz, 50 m/s² : 57-150 Hz
Shock (accord. IEC 60068-2-27)	150 m/s² : 11 ms	150 m/s² : 11 ms	150 m/s² : 11 ms
Mounting	35mm DIN rail	Machine mounting	Machine mounting
Weight (typical)	460 g	570 g	650 g
Functionality	Function block programmable safety controller	Remote I/O device	Remote I/O device
Function blocks	See Note [1]	N/A	N/A
Field signal connections			
Connection type	Terminal block	5-Pole M12 connector	5-Pole M12 connector
Safety capable inputs	8 dual channel	6 dual channel	6 dual channel
Input type required	PNP or contact	PNP or contact	PNP or contact
Input voltage HIGH	11…26.4 V DC	11…30 V DC	11…30 V DC
Input voltage LOW	0…5 V DC	-30…5 V DC	-30…5 V DC
Input current HIGH (typical)	5 mA	5 mA	5 mA
Input delay (configurable; e.g. for contact bounce)	0…126 ms	0…635 ms	0…635 ms
Safety data link inputs [2]	N/A	N/A	2 dual channel
Safety capable outputs	4 dual channel	2 dual channel	2 dual channel
Output type	Source output (PNP)	Bipolar type	Bipolar type
Output switching current	500 mA/channel	2 amps/output	2 amps/output
Output leakage current (maximum)	0.1 mA	0.5 mA	0.5 mA
Mechanical durability (minimum 7200 cycles/hr)	N/A	N/A	N/A
Electrical durability (minimum 1800 cycles/hr at rated load)	N/A	N/A	N/A
Test/Signal outputs (current sourcing)	4	12	12
Test/Signal output current	700 mA/channel	700 mA/channel	700 mA/channel
Test/Signal output leakage current (maximum)	0.1 mA	0.5 mA	0.5 mA
Test output current monitoring (e.g. for muting lamp)	Yes - TOut3	Yes - TOut1A	Yes - TOut1A
DeviceNet Safety™ connection information			
Supports originator (Safety Master) connections	16 max.	N/A	N/A
Supports target (Safety Slave) connections	4 max.	6 max.	6 max.
DeviceNet™ connection information			
Initiates standard master connections	N/A	N/A	N/A
Supports standard slave connections (to same MACID)	2 max.	3 max.	3 max.
UCMM Client	8 open connections max.	N/A	N/A
UCMM Server	5 connections max.	4 connections max.	4 connections max.
Connection(s) to network	5-Pole terminal block and USB connection	5-Pole MINI connector male and female	5-Pole MINI connector male and female

	UE 4421 IP 20 Remote Input/Output Bus Node		
UE4455-03DC9F0	UE4421-22EE900	UE4421-22EE490	UE4421-232EE330
1 028 306	1 028 309	1 028 310	1 028 311
To Category 4	To Category 4	To Category 4	To Category 4
To SIL 3	To SIL 3	To SIL 3	To SIL 3
19.2…28.8 V DC	20.4…26.4 V DC	20.4…26.4 V DC	20.4…26.4 V DC
4-pole MINI connector male and female	Terminal block	Terminal block	Terminal block
14…131°F (-10…+55°C)	14…131°F (-10…+55°C)	14…131°F (-10…+55°C)	14…131°F (-10…+55°C)
IP 67	IP 20	IP 20	IP 20
III	III	III	III
0.35mm : 10-57 Hz, 50 m/s^2 : 57-150 Hz	0.35mm : 10-57 Hz, 50 m/s^2 : 57-150 Hz	0.35mm : 10-57 Hz, 50 m/s^2 : 57-150 Hz	0.35mm : 10-57 Hz, 50 m/s^2 : 57-150 Hz
150 m/s^2 : 11 ms	150 m/s^2 : 11 ms	150 m/s^2 : 11 ms	100 m/s^2 : 11 ms
Machine mounting	35 mm DIN rail	35 mm DIN rail	35 mm DIN rail
650 g	420 g	420 g	460 g
Remote I/O device	Remote input device	Remote I/O device	Remote I/O device
N/A	N/A	N/A	N/A
5-pole M12 connector	Terminal block	Terminal block	Terminal block
6 dual channel	6 dual channel	4 dual channel	2 dual channel
PNP or contact	PNP or contact	PNP or contact	PNP or contact
11…30 V DC	11…26.4 V DC	11…26.4 V DC	11…26.4 V DC
-30…5 V DC	0…5 V DC	0…5 V DC	0…5 V DC
5 mA	6 mA	6 mA	6 mA
0…635 ms	0…126 ms	0…126 ms	0…126 ms
2 dual channel	N/A	N/A	N/A
2 dual channel	N/A	4 dual channel	2 dual channel
Bipolar type	N/A	Source output (PNP)	Relay type
2 amps/output	500 mA/channel	500 mA/channel	500 amps/channel
0.5 mA	0.1 mA	0.1 mA	N/A
N/A	N/A	N/A	5,000,000 operations
N/A	N/A	N/A	100,000 operations
12	4	4	4
700 mA/channel	700 mA/channel	700 mA/channel	700 mA/channel
0.5 mA	0.1 mA	0.1 mA	0.1 mA
Yes - TOut1A	Yes - TOut3	Yes - TOut3	Yes - TOut3
N/A	N/A	N/A	N/A
6 max.	4 max.	4 max.	4 max.
N/A	N/A	N/A	N/A
3 max.	2 max.	2 max.	2 max.
N/A	N/A	N/A	N/A
4 connections max.	2 connections max.	2 connections max.	2 connections max.
5-pole MINI connector male and female	5-pole terminal block	5-pole terminal block	5-pole terminal block

DeviceNet Safety™

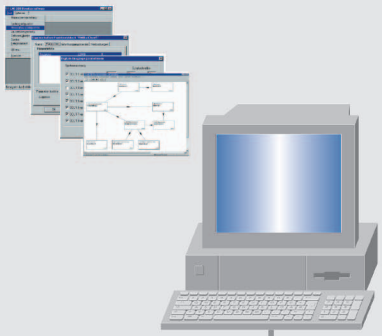
1) The UE 4470 Safety Network supports the following function blocks:
Application specific: E-STOP, AOPD (Safety Light Curtain), Two-Hand Control, Safety Gate Monitoring, User Mode Switch, ON-DelayTimer, OFF-Delay Timer, Signal Routing, External Device Monitoring (EDM), Reset and Restart.
Logical: AND, OR, NOT, Exclusive OR (XOR), Exclusive NOR (XNOR)

2) SICK Safety Data Link (SDL) allows intelligent SICK devices (e.g. C 4000 Safety Light Curtains or S 3000 Safety Scanners) to be connected directly to the UE 4400 IP 67 Bus Nodes. This allows users to perform configuration and obtain diagnostic information for the connected devices over the DeviceNet Safety™ network. Since SDL connectors also include OSSD input signal lines, non-SDL devices may also be connected as standard safety field signal inputs in lieu of an SDL device.

* All values are preliminary. Consult user manual (when available) for updated values.

SICK safety systems – the right decision for today and tomorrow

Linking safety-relevant signals with Intelliface series interface modules



Safety Network Controller

Field bus level

Safety photo-electric switches

Safety bus modules

Safety switches

SDL (Safety Data Link)

SDL

Safety light curtains and multi-beam photoelectric safety switches

intelliface
the intelligent interface

Safety laser scanners

Emergency stop

Safety controllers

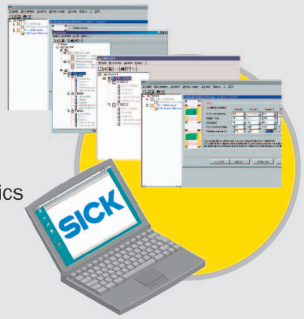
Safety sensors

SDL

Photoelectric switches

intelliface
the intelligent interface

Safety laser scanners



Uniform configuration and diagnostics software

Safety light curtains and multi-beam photoelectric safety switches

Safety switches

2-hand module

Safety relays

Safety photo-electric switch systems

intelliface
the intelligent interface

Safety muting systems

SICK Industrial Safety Systems

Safety laser scanners and Safety camera system

- S 3000
- PLS
- PLS short range
- RLS
- V 4000 Press Brake

Safety light curtains

- C 4000 Micro
- C 4000 Basic
- C 4000 Standard/Advanced
- C 4000 Entry/Exit
- C 4000 Palletizer
- C 2000
- LGT

Multiple light beam safety devices

- M 4000 Standard
- M4000 Advanced (coming soon)
- MSL
- MSL/MSM
- M 2000

Safety photoelectric switches

- L 4000 system
- WSU/WEU 26/2
- WS/WE 12-2 with LE 20
- WS/WE 18-2 with LE 20
- WS/WE 24-2 with LE 20
- WS/WE 27-2 with LE 20
- VS/VE 18-2 with LE 20

Safety switches, sensors and operating devices

- Safety position switches
- Safety switches with separate actuator
- Safety locking devices
- Safety sensors
- Safety operating devices

SICK Industrial Safety Systems

Safety bus modules and Safety network controller UE 1000 series

- UE 4120, UE 4150, UE 4155
- UE 3212, UE 4215, UE 4231, UE 4232
- UE 4420, UE 4421, UE 4450, UE 4470

intelliface the intelligent interface

PROFIBUS

AS-i

DeviceNet Safety

Safety controllers UE 100 series

- UE 440
- UE 470

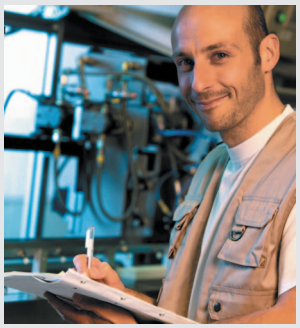
intelliface the intelligent interface

Safety relays UE 10 series

- UE 10 to UE 48

intelliface the intelligent interface

SICK is one of the world's leading manufacturers of safety systems, sensors, and automatic identification products for industrial applications. SICK holds more than 350 patents for its innovative products. Through its Industrial Sensors, Safety Systems, Automatic Identification, and Environmental and Process Analysis divisions, the company has operations in 65 countries. SICK North America is headquartered in Minneapolis, MN.



Products from SICK provide comprehensive safeguarding of both workers and machinery. As specialists in sensor technology, SICK develops and manufactures pioneering products that provide protection in hazardous zones, dangerous locations and for safeguarding access points. By providing services, which encompass all aspects of machine safety and security, SICK is setting new standards in safety technology.

Our wide range of sensors provides solutions to suit any application in the field of automation. Even under rugged ambient conditions, objects are reliably detected, counted and positioned regardless of their form, location and surface finish.

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Australia
Phone +61 3 94 97 41 00
0 08 33 48 02 – toll free
Fax +61 3 94 97 11 87

Austria
Phone +43 22 36 62 28 80
Fax +43 22 36 62 28 85

Belgium/Luxembourg
Phone +32 24 66 55 66
Fax +32 24 63 35 07

Brazil
Phone +55 11 55 61 26 83
Fax +55 11 55 35 41 53

China
Phone +852 27 63 69 66
Fax +852 27 63 63 11

Czech Republic
Phone +42 02 57 81 05 61
Fax +42 02 57 81 05 59

Denmark
Phone +45 45 82 64 00
Fax +45 45 82 64 01

Finland
Phone +358 9 7 28 85 00
Fax +358 9 72 88 50 55

France
Phone +33 1 64 62 35 00
Fax +33 1 64 62 35 77

Germany
Phone +49 21 15 30 10
Fax +49 21 15 30 11 00

Great Britain
Phone +44 17 27 83 11 21
Fax +44 17 27 85 67 67

Italy
Phone +39 02 92 14 20 62
Fax +39 02 92 14 20 67

Japan
Phone +81 3 33 58 13 41
Fax +81 3 33 58 05 86

Korea
Phone +82 2 786 63 21-4
Fax +82 2 786 63 25

Netherlands
Phone +31 3 02 29 25 44
Fax +31 3 02 29 39 94

Norway
Phone +47 67 56 75 00
Fax +47 67 56 61 00

Poland
Phone +48 2 28 37 40 50
Fax +48 2 28 37 43 88

Singapore
Phone +65 67 44 37 32
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Spain
Phone +34 9 34 80 31 00
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Sweden
Phone +46 86 80 64 50
Fax +46 87 10 18 75

Switzerland
Phone +41 4 16 19 29 39
Fax +41 4 16 19 29 21

Taiwan
Phone +886 2 23 65 62 92
Fax +886 2 23 68 73 97

USA/Canada/Mexico
Phone +1 (952) 9 41 67 80
Fax +1 (952) 9 41 92 87

Branch offices and representatives in all major industrial countries.

SICK

6900 West 110th Street • Minneapolis, MN 55438 USA
Phone 800.325.SICK (7425) • Fax 952.941.9287 • www.sickusa.com

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